

What is Claimed is:

1. A VSB reception system comprising:

a demodulating part for receiving, converting, and demodulating a signal;

a frequency domain equalizing part for equalizing the demodulated signal for
5 removing a distorted component from the demodulated signal; and

a noise removing part for (a) receiving the equalized signal, (b) calculating a reference error signal that is a difference between the equalized signal and the signal having the noise removed therefrom, (c) calculating an error signal that is a difference between the reference error signal and the extracted noise signal, (d) renewing parameters with reference
10 to the reference error signal and the error signal, and (e) calculating a difference between the equalized signal and the extracted noise signal, to provide a signal having the noise removed therefrom.

2. The VSB reception system as claimed in claim 1, wherein the demodulating part
15 carries out tuning to a desired channel from received RF (Radio Frequency) signals, converting a RF signal on the tuned channel into an IF (Intermediate Frequency) signal, and demodulating the IF signal in reverse of a VSB modulating method.

3. The VSB reception system as claimed in claim 1, wherein the frequency domain
20 equalizing part carries out converting a received time domain signal into the frequency domain signal, equalizing the frequency domain signal, and converting the equalized frequency domain signal into a time domain signal.

4. The VSB reception system as claimed in claim 1, wherein the frequency domain equalizing part carries out assuming a channel impulse response from a received time domain signal, converting the assumed channel impulse response and the time domain signal into frequency domain signals respectively, renewing parameters with reference to the converted
5 frequency domain signal, to correct a distortion of the frequency domain signal, and converting the frequency domain signal having the distortion therein corrected into a time domain signal.

5. The VSB reception system as claimed in claim 1, wherein the noise removing part
10 includes;

a first operator for calculating a difference between signals from/to the noise removing part, to provide a reference error signal,

a second operator for calculating a difference between the reference error signal and the extracted noise signal, to provide an error signal,

15 a filtering part for renewing parameters with reference to the reference error signal from the first operator and the error signal from the second operator, to extract a noise signal, and

a third operator for calculating a difference between a signal from the noise removing part and the noise signal extracted at the filtering part to provide a signal having the noise
20 removed therefrom.

6. The VSB reception system as claimed in claim 5, further comprising a deciding part between the first operator and the third operator for making decision with reference to a signal from the third operator.

7. The VSB reception system as claimed in claim 6, wherein the deciding part is a VSB slicer.

5 8. The VSB reception system as claimed in claim 5, wherein the noise removing part further includes;

 a first delay for delaying, and forwarding a signal received at the noise removing part to the first operator,

 a second delay for delaying, and forwarding a signal from the third operator to the
10 first delay, and

 a third delay for delaying, and forwarding the noise signal extracted at the filtering part to the second operator.

 9. The VSB reception system as claimed in claim 5, wherein the filtering part is an
15 LMS (Least Mean Square) filter for renewing the parameters by LMS method.

 10. The VSB reception system as claimed in claim 9, wherein the renewal of the parameters by LMS method uses the following equation.

$$c(k, n+1) = c(k, n) + u * e(n) * x(k, n)$$

20 where, 'n' denotes 0, 1, 2, ----, and 'k' denotes a (k)th tap parameter. 'u' denotes a constant for fixing a magnitude of a renewed value, 'e(n)' denotes a received error value, 'x(k, n)' denotes an input value of a (k)th tap at a time 'n'.

 11. The VSB reception system as claimed in claim 5, wherein the first, second, and

third operators are subtractors or adders.